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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,621	01/31/2006	Valery Leblond	4590-422	5002

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LOWE HAUPTMAN GILMAN & BERNER, LLP
1700 DIAGNOSTIC ROAD, SUITE 300
ALEXANDRIA, VA 22314

EXAMINER	
HU, RUI MENG	
ART UNIT	PAPER NUMBER
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/539,621	Applicant(s) LEBLOND ET AL.	
	Examiner RuiMeng Hu	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/31/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

1. The present Office Action is based upon the original patent application filed on 01/31/2006 as modified by the preliminary amendment filed on 06/17/2005. **Claims 1-25** are now pending in the present application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement submitted on 01/31/2006 been considered by the Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. **Claims 1-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Betz et al. (US PGPub. 2004/0071200).**

Consider **claim 1**, Betz et al. clearly disclose a method of processing an analog signal whose frequency spectrum exhibits over a determined bandwidth two main lobes separated by a frequency band where the power is negligible, (paragraph 5, Binary Offset Carrier (BOC) has two main lobes, and the frequency band between the two main lobes is negligible) comprising: sampling according to a determined sampling frequency (figure 10, a determined sampling frequency of Down-Sampling 298).

However Betz et al. fail to specifically disclose prior to the sampling, in performing a frequency translation of the two main lobes towards one another with a view to reducing the bandwidth and hence the sampling frequency.

In paragraph 124, Betz et al. clearly stated that the re-sampling rate is typically chosen to be twice the reciprocal of the spacing between the correlation peak and the nearest zero to the correlation peak. For a BPSK modulated signal, this re-sampling

rate (e.g., 10.23 MHz) is typically twice the spreading code rate (e.g., 5.115 MHz), for such case, the sampling rate of said BPSK is the minimum possible rate wherein the BPSK signal is sampled at 0 frequency or base-band, 10.23 MHz = 2 * (5.115MHz) (figure 6, Down conversion and sampling, in figure 9, selecting and filtering the upper and lower lobes of the BOC, in figure 10, Down Sampling 298, paragraphs 15, 21, 124, 125, 127).

Since the upper and lower sidebands of the BOC signal are filtered and treated separately, thus it would have been obvious to a ordinary skilled person in the art to down convert each of the sidebands to 0 frequency or a frequency lower than the sub-carrier rate to achieve a sampling rate commensurate with the spreading code rate.

Consider **claim 2 as applied to claim 1**, Betz et al. as modified clearly disclose wherein the signal comprising a carrier (paragraph 4, carriers for GPS L1 and L2 bands) and a subcarrier (paragraph 5, for example a sub-carrier rate of 10.23MHz and a spreading code rate of 5.115 MHz) of determined frequency and the main lobes exhibiting determined bandwidths, the performing a frequency translation is performed by multiplying the analog signal by a signal of the type cos(.omega. t), .omega. being determined as a function of the subcarrier frequency and of the bandwidth of the main lobes (in order to down-convert upper and lower sidebands to 0 frequency or a frequency lower than the sub-carrier rate inherently requires a mixer mixing with an oscillating signal being determined as a function of the sub-carrier rate and spreading code rate as to reduce the sampling rate to the minimum as possible).

Consider **claim 3 as applied to the claim 2**, Betz et al. as modified clearly disclose wherein the translation of the main lobes having generated spurious lobes, and the method furthermore comprises, prior to the sampling, filtering the translated lobes with a view to eliminating the spurious lobes (figure 9, upper and lower sideband selection filters 292, paragraph 123).

Consider **claim 4 as applied to claim 1**, Betz et al. as modified clearly disclose wherein the translation of the lobes and the sampling are grouped together into a single step consisting in sampling the analog signal according to a specific sampling frequency fe.sub.s (in figure 10, Down Sampling 298 deals with down conversion and sampling, a specific sampling frequency of Down Sampling 298 could be chosen dynamically such as being determined as a function of the sub-carrier rate).

Consider **claim 5 as applied claim 4**, Betz et al. as modified clearly disclose wherein the analog signal having been modulated by a carrier (L1 and L2 band carriers) and a subcarrier of frequency f.sub.sp, the frequency fe.sub.s is related to the frequency f.sub.sp by the following relation f.sub.sp=N.fe.sub.s-fe.sub.s/4, N being a determined integer greater than or equal to 1 (it is a design choice, in paragraphs 125, 130, quoted In general, both the feasibility and benefits improve for BOC modulations where the ratio of sub-carrier frequency to spreading code rate is high, consider designs BOC(10,5) and BOC(5,1)).

Consider **claim 6 as applied to claim 5**, Betz et al. as modified clearly disclose wherein N is the largest value possible to obtain the relation (it is a BOC design choice,

the ratio of sub-carrier frequency to spreading code rate increases as the N increases, which is favorable).

Consider **claim 7 as applied to claim 1**, Betz et al. as modified clearly disclose further comprising: converting the analog signal to baseband (figure 6).

Consider **claim 8 as applied to claim 7**, Betz et al. as modified clearly disclose wherein the frequency spectrum exhibiting sidelobes around each main lobe, the sidelobes eliminated by filtering (figure 9, upper and lower sideband selection filters 292, paragraph 123).

Consider **claim 9 as applied to claim 1**, Betz et al. as modified clearly disclose characterized in that the main lobes are identical (paragraph 15).

Consider **claim 10 as applied to claim 1**, Betz et al. as modified clearly disclose wherein the analog signal is a signal modulated according to a BOC type modulation (paragraph 15).

Consider **claim 11 as applied to claim 1**, Betz et al. as modified clearly disclose wherein the analog signal is a radio-navigation signal (paragraph 123).

Consider **claim 12 as applied to claim 10**, Betz et al. as modified clearly disclose wherein the BOC signal (paragraph 123) comprising a carrier (GPS L1 and L2 carriers), a code (GPS M code) and a sub-carrier (a square wave as a sub-carrier for BOC modulation), respectively exhibiting determined frequencies, and the method further comprising: of digitizing the sampled signal (figure 6, Sampling/ADC 206), and; demodulating the digitized signal based on the use of a code and of a sub-carrier that are generated locally (figure 2, demodulating means 212, 216, 218, 222), the local code

being generated on the basis of the frequency of the code (figure 2, cross-correlating means 212), the local sub-carrier being generated on the basis of the frequency of the sub-carrier determined and reduced during the step of translating the lobes (figure 10, down-sampling 298 down converts upper and lower sidebands to 0 frequency, inherently requires a local oscillating wave as a function of the frequency of the sub-carrier).

Consider **claim 13 as applied to claim 11**, Betz et al. as modified clearly disclose wherein the radionavigation signal is that of the Galileo or Glonass or GPS system (paragraph 15).

Consider **claim 14**, Betz et al. clearly disclose a device for processing an analog signal (GPS M-code signal) whose frequency spectrum exhibits over a determined bandwidth two main lobes separated by a frequency band where the power is negligible, (paragraph 5, Binary Offset Carrier (BOC) has two main lobes, and the frequency band between the two main lobes is negligible).

However Betz et al. fail to specifically disclose an element for translating the frequency of the main lobes towards one another which is able to reduce the bandwidth.

In paragraph 124, Betz et al. clearly stated that the re-sampling rate is typically chosen to be twice the reciprocal of the spacing between the correlation peak and the nearest zero to the correlation peak. For a BPSK modulated signal, this re-sampling rate (e.g., 10.23 MHz) is typically twice the spreading code rate (e.g., 5.115 MHz), for such case, the sampling rate of said BPSK is the minimum possible rate wherein the BPSK signal is sampled at 0 frequency or base-band (figure 6, Down conversion and

sampling, in figure 9, selecting and filtering the upper and lower lobes of the BOC, in figure 10, Down Sampling 298, paragraphs 15, 21, 124, 125, 127).

Since the upper and lower sidebands of the BOC signal are filtered and treated separately, thus it would have been obvious to a ordinary skilled person in the art to down convert each of the sidebands to 0 frequency or a frequency lower than the sub-carrier rate to achieve a sampling rate commensurate with the spreading code rate.

Consider **claim 15 as applied to claim 14,** Betz et al. as modified clearly disclose furthermore comprising: a converter of the analog signal into baseband linked to the device for translating the main lobes and placed upstream of the translation device (figure 6, block Down-conversion and Filtering).

Consider **claim 16 as applied to claim 15,** Betz et al. as modified clearly disclose furthermore comprising: a band-pass filter linked to the base-band analog signal converter and placed between the base-band converter and the translation device (figure 9, upper and lower sideband filters).

Consider **claim 17 as applied to claim 14,** Betz et al. as modified clearly disclose wherein the signal comprising a carrier (GPS L1 and L2 band carriers) and a subcarrier (a subcarrier of BOC modulation) of determined frequency and the main lobes exhibiting determined bandwidths (the frequency of the subcarrier and the bandwidths of the main lobes are determined as a design choice, consider BOC(10,5) and BOC(5,1)), the device for translating the main lobes comprises a multiplier of the analog signal by a signal of the type cos(.omega. t), .omega. being determined as a function of the subcarrier frequency and of the bandwidth of the main lobes (in figure 10,

i.e. Down Sampling 298 down converting upper and lower sidebands to 0 frequency or a frequency lower than the sub-carrier rate inherently requires a mixer mixing with an oscillating signal being determined as a function of the sub-carrier rate and spreading code rate as to reduce the sampling rate to the minimum as possible).

Consider **claim 18 as applied to claim 17,** Betz et al. as modified clearly disclose wherein the device for translating the main lobes furthermore comprises, linked to the multiplier and placed downstream of the latter, a low-pass filter (in paragraph 124, Betz et al. clearly stated that For a BPSK modulated signal, this re-sampling rate (e.g., 10.23 MHz) is typically twice the spreading code rate (e.g., 5.115 MHz), said BPSK signal required to be filtered by a low pass filter as to remove side lopes, same idea would be employed to filter upper and lower sidebands by a lower pass filter).

Consider **claim 19 as applied to claim 17,** Betz et al. as modified clearly disclose wherein the multiplier is linked to a sampler (a mixer inherently existed in down-converting of the sidebands to 0 frequency or a frequency lower than the subcarrier, figure 10, Down-Sampling 298).

Consider **claim 20 as applied to claim 14,** Betz et al. as modified clearly disclose wherein the device for translating the main lobes comprises a sampler able to sample the analog signal according to a specific sampling frequency fe.sub.s (in figure 10, Down Sampling 298 deals with down conversion and sampling, a specific sampling frequency of Down Sampling 298 could be chosen dynamically such as being determined as a function of the sub-carrier rate).

Consider **claim 21 as applied to claim 19,** Betz et al. as modified clearly disclose wherein the sampler is linked to a digitizer (figure 10, 298 is both a sampler and a digitzer).

Consider **claim 22 as applied to claim 14,** Betz et al. as modified clearly disclose wherein the analog signal is a radio-navigation signal (paragraph 123).

Consider **claim 23 as applied to claim 21,** Betz et al. as modified clearly disclose wherein the radio-navigation signal comprising a carrier (GPS L1 and L2 band carriers), a code (BOC) and a sub-carrier (a sub-carrier of BOC modulation) that are generated by a satellite, respectively exhibiting determined frequencies (consider BOC(10,5) and BOC(5,1)), the device further comprises, linked to the digitizer, a feedback loop for slaving a code (figure 2) and a sub-carrier that are generated locally by the device, this loop comprising an element (detector 222) for calculating the local phase of the code on the basis of the code frequency determined and an element (detector 222) for calculating the local phase of the sub-carrier on the basis of a sub-carrier frequency calculated on the basis of the determined sub-carrier frequency, these elements for calculating phase being distinct (figure 2, these features are existed in GPS receivers as for processing of received radio-navigation signal in cross-correlation means 212 and code Doppler compensator, reference signal generator 214 generates upper and lower sideband reference signals 294 and 296 (from figure 9), these reference signals are generated based on the code frequency and the sub-carrier frequency determined by the Detector 222).

Consider **claim 24 as applied to claim 14,** Betz et al. as modified clearly disclose wherein the lobes are identical (the lobes of a BOC signal are identical).

Consider **claim 25 as applied to claim 14,** Betz et al. as modified as modified clearly disclose a receiver of a radio-navigation system, comprising: a device for processing an analog signal (the receiver of figure 2).

Conclusion

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RuiMeng Hu whose telephone number is 571-270-1105. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571-272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RuiMeng Hu
R.H./rh
January 25, 2007

EDAN ORGAD
PRIMARY PATENT EXAMINER
Edan Orgad 2/5/07